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United States Department of Agriculture,  
BUREAU OF PLANT INDUSTRY,

Seed and Plant Introduction and Distribution,  
WASHINGTON, D. C.

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DISTRIBUTION OF THE COLMAN CITRANGE  
IN 1907.

In the course of the experiments conducted by the Office of Plant Breeding Investigations of this Bureau, several new hardy citrus fruits, or citranges, have been produced, which are believed to possess special value for general cultivation in the southern sections of the United States.

Cooperative arrangements were made by which the trees of the new varieties are to be distributed through this Office, and Dr. Herbert J. Webber, Physiologist in Charge of Plant Breeding Investigations, has prepared this circular especially to accompany the trees of the Colman citrange.

LISLE MORRISON,  
*Assistant in Charge.*

Approved:

B. T. GALLOWAY,  
*Chief of Bureau.*

WASHINGTON, D. C., *March 2, 1907.*

## DISTRIBUTION OF THE COLMAN CITRANGE.

### ORIGIN AND DESCRIPTION.

For several years the Department of Agriculture has had in progress experiments in the production of hardy frostproof oranges. The Trifoliate orange, which is grown extensively as a hedge plant in the southern United States, endures cold winters without injury as far north as New York. The fruit of this orange is small, very acrid, gummy, seedy, and inedible. In the course of the experiments this hardy species was crossed with the ordinary sweet orange, with the object of producing hybrids combining the hardy, cold-resisting character of the Trifoliate species with the desirable fruit qualities of the sweet orange. From the numerous crosses made by the writer, in conjunction with Mr. W. T. Swingle, of the Department of Agriculture, a number of hybrids were produced, and several of these which have been grown and tested give evidence of being of considerable value. These new hybrid fruits are very different from the orange, lemon, lime, and other members of the citrus family, and have been named citranges.

One of these new varieties, or citranges, which is a hybrid of the Trifoliate orange used as the mother parent and the common orange as the father parent, has, with the approval of the Secretary of Agriculture, been named the "Colman," in recognition of the valuable services to agriculture and to this Department of Hon. Norman J. Colman, under whose administration as Commissioner of Agriculture, during President Cleveland's first term, the agricultural work of the Government was organized as a separate Department. A technical description of the Colman citrange follows:

Fruit compressed spherical, frequently rather one-sided or oblique, large but rather smaller than the Morton citrange,  $2\frac{1}{2}$  to  $2\frac{7}{8}$  inches high and from  $2\frac{3}{4}$  to  $3\frac{3}{4}$  inches in diameter; color light orange or lemon yellow, lighter than the Morton and Willits citranges (by Ridgway's standards the Colman citrange is between saffron yellow and Indian yellow, while the Morton is between deep chrome and cadmium yellow); surface mainly very smooth, slightly roughened, as in the ordinary orange, by slight depressions over some of the large oil glands, covered with numerous short, stiff, colorless hairs; occasionally with a few slight furrows near base; weight, heavy for size of fruit, from 6 to 9 ounces, usually averaging about 8 ounces, somewhat lighter than water; calyx persistent but dried up and inconspicuous, as in case of ordinary orange; rind medium thin, one-eighth to three-sixteenths of an inch in thickness, adhering to fruit about as in the ordinary Florida orange, being removed with moderate ease; in taste bitter and disagreeable, intermediate between the ordinary and Trifoliate orange; oil glands small and comparatively few, spherical or oblate-spherical, with major axis parallel to surface, smaller and of different shape from those of the Morton, Savage, and other citranges and closer to the surface; pulp translucent, light lemon yellow, by Ridgway's standards wax yellow, lighter than the pulp of the Morton; pulp vesicles longer and smaller in diameter than those of the ordinary

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orange; tender; segments 10 to 14, separating membranes somewhat thicker than in good ordinary oranges, with pronounced bitterness derived from Trifoliate; texture of fruit tender, very juicy; axis small, one-fourth to one-half of an inch in diameter; flavor a sprightly bitter acid, nearly as sour as a lemon and with a peculiar stimulating bitter taste; almost totally seedless, averaging one seed to six fruits; aroma very pleasant and pronounced, differing from any other citrus fruit, suggesting Trifoliate but milder; tree similar to Trifoliate in shape but with denser foliage, evergreen or semi-evergreen, thorny, of medium height and shapely; fruit stems large and stiff, in many cases holding fruit erect; leaves in general trifoliolate but frequently unifoliolate, nearly twice the size of those of the Trifoliate orange; season of maturity medium early, from the middle of September to the last of November.

The Colman is an exceedingly interesting citrange of large size and very good appearance. It is differentiated from other citranges by having the surface covered with short colorless hairs, a character derived from the Trifoliate orange parent. This character serves to mark the variety and in no way detracts from its good appearance.

The Colman is primarily recommended for use in making citrangeade. It makes a rich orange-colored ade of high quality, with a dash of bitterness which is very attractive to some palates. This quality, like the bitter principle of the grapefruit, or pomelo, is doubtless stimulating and healthful. The juiciness of this variety, its seedlessness, and large size especially fit it for use as an ade fruit. It also makes a very fair marmalade, and other uses for it will doubtless be found. The tree is of fine appearance and is well worthy of cultivation as a lawn tree aside from the value of the fruit.

#### HARDINESS.

While the hardiness or cold resistance of the Colman citrange has not been thoroughly tested, it is known to be very hardy in comparison with the ordinary orange. Young trees in northern Florida have endured temperatures between 15° and 18° F. without noticeable effect. In tests at the Georgia and Alabama agricultural experiment stations the trees of this variety have also shown themselves to be very hardy.

It is believed that the trees can be grown without protection in South Carolina, Georgia, northern Florida, Alabama, southwestern Tennessee, Mississippi, Louisiana, eastern and southern Texas, southern Arkansas, southern Arizona, southern New Mexico, and the warm regions of low altitude in California, Oregon, and possibly Washington. The distribution of the stock of this variety by the Department of Agriculture will be limited to these sections.

#### CULTIVATION.

The Colman citrange is not recommended for commercial cultivation on a large scale. While the fruit is of undoubted value, it does not compare in quality with the fine oranges of Florida and California. Its

greatest value will probably be in its use as a "home" fruit. A few trees should be grown in the yard or garden, and these will furnish sufficient fruits for home use.

The trees for distribution are budded on hardy Trifoliate orange stocks. The buds were inserted low on the stocks, and the point of the union of the stock and scion can in most cases be distinguished about 3 to 6 inches above the roots.

No special soil can be recommended at present for the citrange, as our experiments with the variety are as yet too limited. The soil, however, should be thoroughly drained.

In planting, follow the ordinary practice employed with other fruit trees, such as peach trees, pear trees, etc. The tree of the Colman citrange grows to a height of from 15 to 20 feet, or more, with a top from 10 to 12 feet in diameter.

In most soils the trees will require to be manured if they are to do well. Citrus trees in general require a fertilizer high in potash content. The ordinary orange-tree fertilizer contains from 3 to 4 per cent of ammonia, 5 to 6 per cent of phosphoric acid, and from 10 to 13 per cent of potash. The citrange should probably be cultivated in general about the same as peach trees.

Ordinarily citrus trees are not pruned, except when young to guide and shape the first growth. It is believed that very little or no pruning will be necessary with the citrange.

The trees distributed are buds from seven to eight months old, and if they receive proper care they should produce their first fruit in from three to four years after planting.

#### REPORT OF RESULTS DESIRED.

The cultivation of the citrange is as yet experimental, as the fruit is new and comparatively untried. The extension of the cultivation of the different varieties and the results obtained with them will form an interesting item in the annals of American horticulture. It is earnestly urged that all persons who receive the trees give them special care. A record will be kept by the Department of Agriculture of the name and address of every person to whom stock is sent, and in due time reports will be requested from each one on the condition of the trees and the results obtained. The trees sent out are of considerable value in view of their limited number and the fact that stock of these trees can not be obtained elsewhere. Persons who receive trees are urged to aid the Department in introducing and establishing the variety by making notes on the trees as to hardiness, behavior under the methods of fertilization and cultivation given, character of soil, and value and uses of the fruit, etc., and be prepared to furnish the Department with a careful record in regard to the results obtained.

## PUBLICATION ON THE COLMAN CITRANGE.

A detailed report has been prepared, giving an account of the experiments which led to the production of the Colman citrange and containing colored and photographic illustrations of the fruit. As soon as this report is printed a copy will be sent to every person who has received trees of the variety.

HERBERT J. WEBBER,  
*Physiologist in Charge of  
Plant Breeding Investigations.*

Approved:

A. F. WOODS,  
*Assistant Chief of Bureau.*

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